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BIOLOGICAL INVESTIGATIONS OF THE DEEP SEA. 38. A NEW WESTERN ATLANTIC *DIPSACASTER* (ECHINODERMATA, ASTEROIDEA) WITH THE DISTRIBUTION OF KNOWN SPECIES[1]

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Four sea stars collected north of the Little Bahama Bank by the R/V *Gerda* of the Institute of Marine Sciences, University of Miami, represent a new species of *Dipsacaster*. The discovery of this species extends the range of the genus *Dipsacaster* to the western Atlantic (Table 1).

The astropectinid genus *Dipsacaster* was erected by Alcock (1893a:87) for a new species, *D. sladeni*, from the Andaman Sea. *Dipsacaster* may be distinguished from related genera by the inferomarginal plates, which project beyond the superomarginals, forming the lateral margins. Other distinguishing characters are the large actinal intermediate areas, the large papular area, the presence of an anal aperture, gonads that extend far along the arms, and a large madreporite covered by paxillae.

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The terminology employed has been adopted mainly from the works of Walter K. Fisher, Ailsa M. Clark, and F. Jen-

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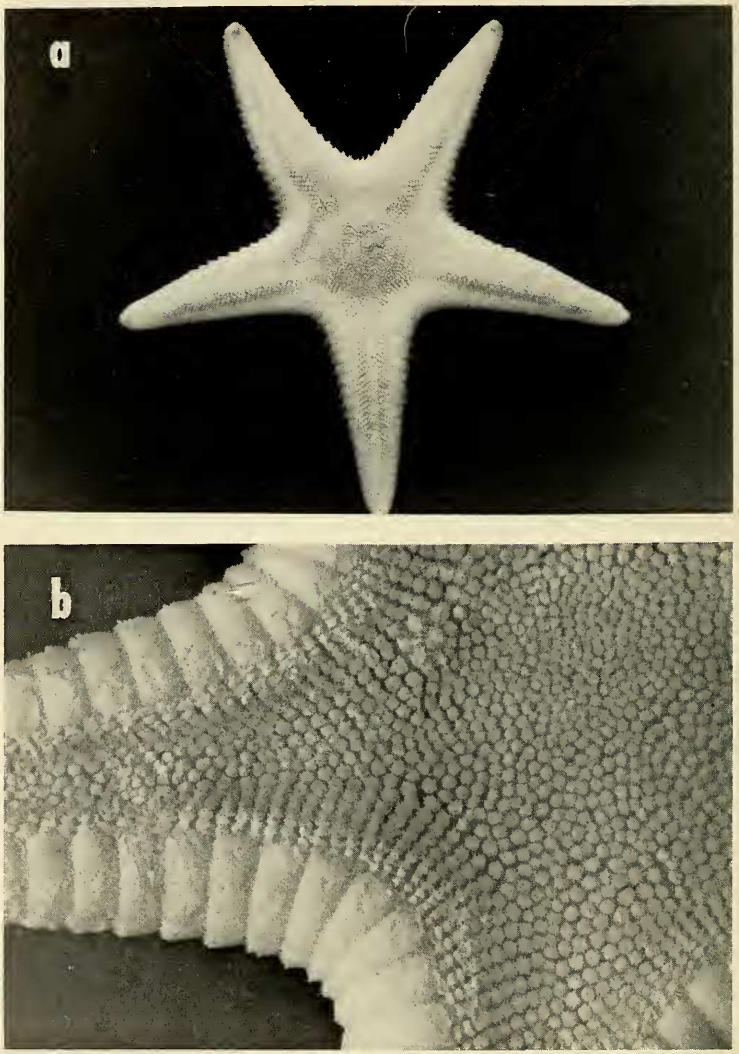

FIGURE 1. a, Holotype, abactinal view, 0.9×.—b, Paratype, abactinal view, 3.5×.

senius Madsen. The number of marginal plates represents those from one arm tip to the tip of an adjacent arm.

The abbreviations USNM and UMML refer to the United States National Museum and the museum of the Institute of

Marine Sciences (University of Miami Marine Laboratory), respectively.

Dipsacaster antillensis new species

Material Studied: Holotype: R = 44 mm, r = 16 mm, R/r = 2.7; 27°56′ N, 78°40′ W, 860–897 m, R/V *Gerda* sta. G-182, 22 July 1963, USNM E10854. Paratypes: 27°49′N, 78°45′W, 824 m, R/V *Gerda* sta. G-403, 20 September 1964, UMML 40.210, 3 specimens.

Diagnosis: Inferomarginal plates up to four times as wide as long, covered by hemispherical granules; plates with tuft of one to four short, blunt, poorly developed spines on distal portion of free edge. Median areas of arms distinctive, due to their elevation and smaller paxillae. Arms tapering gradually.

Description: Five arms. R = 44 mm, r = 16 mm, R/r = 2.7r.

The general form is stellate; the arms taper gradually to a bluntly pointed tip. The body is flat, with a slightly elevated carinal ridge along the arms. The interbrachial arcs are wide, round.

The abactinal surface is paxillose, extending to the terminal plates on the arms. The paxillae are regularly arranged, and conspicuously smaller along the median areas of the arms. Each paxilla consists of a convex base, from which a short, broad pedicel arises. Each pedicel bears about twenty long, thin, laterally directed spinelets around its periphery; and about six short, stout, blunt, dorsally directed spinelets in the middle. Papulae are found throughout the abactinal surface; there are usually six surrounding each plate.

There are forty-five marginal plates in each series. The marginal fascioles in the interbrachial arcs are wide and deep.

The massive superomarginal plates are three to four times as broad as long in the interbrachial arc, diminishing in width distally, so that they are twice as broad as long in the middle of the arms and almost square near the terminal plate. The superomarginals are completely covered by large, hemispherical, closely crowded granules. The terminal plate is small; its distal end is notched, proximal end truncate.

The inferomarginal plates correspond with and are broader than the superomarginals. They are covered by large, round, crowded granules, becoming spiniform in the fasciolar grooves and toward the free edge; these spinelets are delicate and thin in the fasciolar grooves, larger and lanceolate along the free edge. There is a tuft of one to four short, stout, conical or truncate spines in the distal corner of the free edge.

The actinal intermediate area is large, the plates being arranged in a regular series parallel to the inferomarginals. The actinal plates are strongly carinate; each is covered by a tuft of spinelets. These spinelets are slender and pointed outward along the periphery of the plate; they are shorter, stouter, often clavate, and facing the marginals in the center of the plate. A wide channel separates the actinal and adambulacral plates.

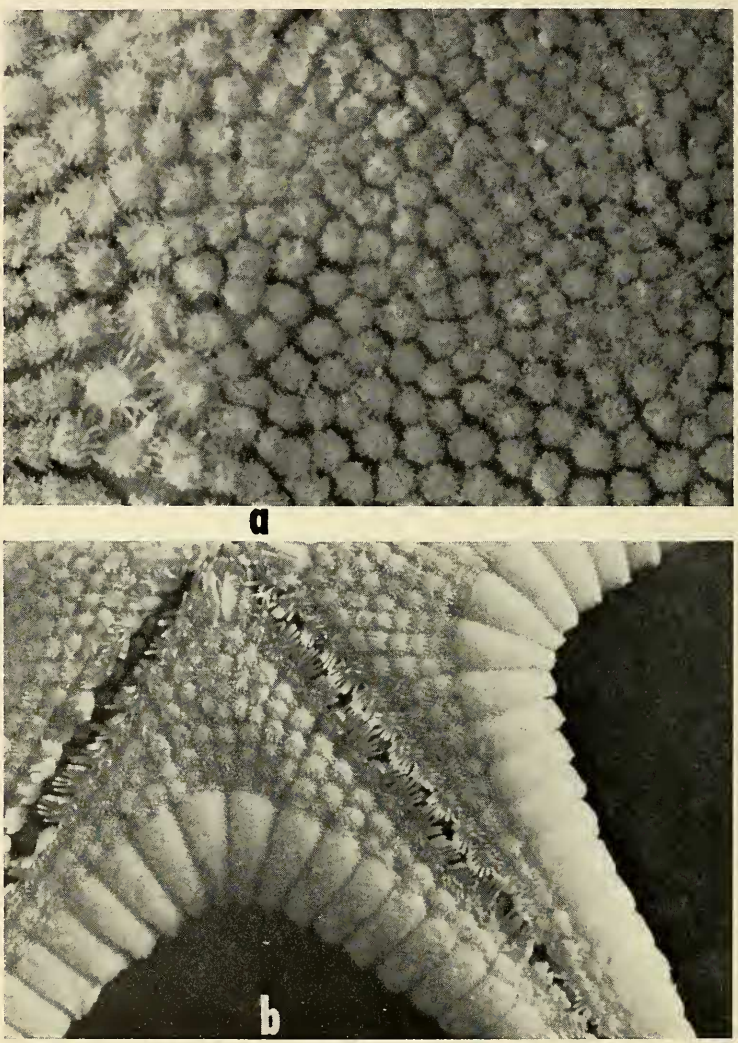

FIGURE 2. a, Paratype, abactinal surface, 8×; note madreporite at lower left.—b, Paratype, actinal view, 3×.

The adambulacral plates are moderately large and have a curved furrow margin. There are six to seven long, blunt, compressed furrow spines; the longest spines are in the center of each series. There are two or three irregular subambulacral rows of three to five tapering,

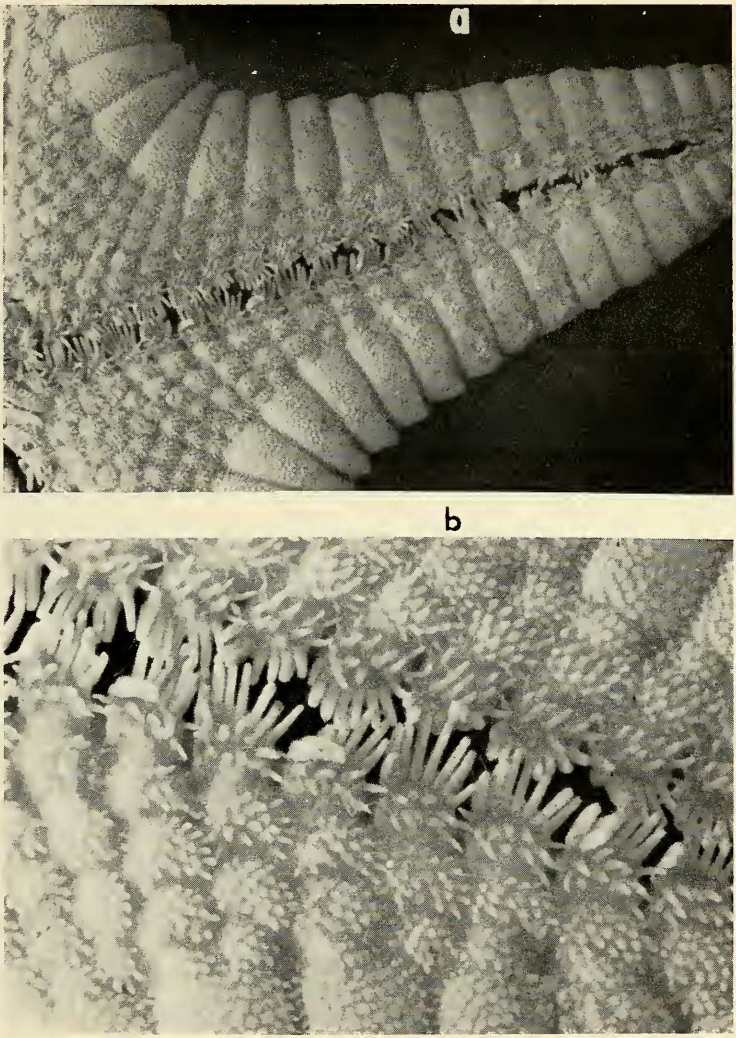

FIGURE 3. a, Paratype, actinal view, 3.5×.—b, Paratype, actinal view, 10.5×.

pointed spines. The subambulacral spines are about half as long as and more slender than the furrow spines.

The mouth plates are large and prominent. Each mouth plate bears seven to ten closely crowded furrow spines; these spines are strongly

TABLE 1. Distribution of known species of *Dipsacaster*.

Species	Distribution	Source
D. eximius Fisher, 1905	off California, Monterey Bay to San Diego, 377–961 m	Fisher (1911, p. 90)
D. anoplus Fisher, 1910	Washington to San Diego, 549–1,464 m	Fisher (1911, p. 100)
	Bering Sea, 2,200 m	Baranova (1957, p. 156)
	Pribilof Islands, 220–640 m	Djakonov (1950, p. 28)
	Sea of Okhotsk, Kurile Islands, 2,000 m	Djakonov (1958, p. 286)
D. borealis Fisher, 1910	Bering Sea and south of Aleutian Islands, 221–642 m	Fisher (1911, p. 94)
	Pribilof Islands, 220–235 m	Baranova (1957, p. 157)
D. laetmophilus Fisher, 1910	southeast of Alaska Peninsula, 1,272 m	Fisher (1911, p. 97)
D. nesiotes Fisher, 1906	Hawaiian Islands, 518–564 m	Fisher (1906, p. 1028)
	Molucca Islands, 498–527 m	Fisher (1919, p. 145)
D. pretiosus (Döderlein, 1902)	Tokyo and Sagami Bays, Japan, 20–200 m	Döderlein (1921, p. 22)
	Uraga Channel, Misaki, Toyama Bay, off Miho, Japan, 20–480 m	Okada et al. (1966, p. 154)
D. grandissimus Goto, 1914	off Misaki, Japan, 640 m	Goto (1914, p. 257)
D. magnificus (H. L. Clark, 1916)	Great Australian Bight, 146–220 m	H. L. Clark (1916, p 32)
	Cook Strait, New Zealand, 101–115 m	Fell (1958, p. 6)
D. diaphoris Fisher, 1913	Philippine Islands, Sulu Sea, 701–1,473 m	Fisher (1919, p. 153)
D. imperialis Fisher, 1917	Philippine Islands, 622 m	Fisher (1919, p. 148)
D. pentagonalis Alcock, 1893a	Andaman Sea, 205 m	Alcock (1893a, p. 172)
D. sladeni sladeni Alcock, 1893	Andaman Sea, 458 m	Alcock (1893a, p. 172)
D. farquharsoni Macan, 1938	Maldives, 229 m	Macan (1938, p. 343)
D. sladeni capensis A. M. Clark, 1952	Cape of Good Hope, 110–329 m	Bell (1905, p. 243)
	Cape of Good Hope, 240–631 m	H. L. Clark (1923, p. 247)
	Cape of Good Hope, 190–403 m	H. L. Clark (1925, p. 3)
	off East London, S. Africa, and Cape of Good Hope, 170–326 m	Mortensen (1933, p. 237)
	off Cape Town, S. Africa, 329–357 m	A. M. Clark (1952, p. 194)

compressed and stouter than the adambulacral furrow spines. The two spines behind the median spines are very stout; the rest of the mouth plate pair is covered by short, blunt spines which increase in size toward the suture.

The madreporite is very large, and is covered by paxillae. It is located in the middle of an interradius, close to the superomarginals. The anal pore is in an elevated area in the center of the disk; the paxillae on this anal elevation are short and crowded.

There are no pedicellariae. Superambulacral ossicles are present as slender rods. The tube feet are large and pointed; the ampullae are double. The gonads are in a longitudinal dichotomous series on either side of the median radial area, extending slightly beyond the middle of the arm.

Measurements, ratios, and number of marginal plates in each of the paratypes as follows:

R (mm)	*r (mm)*	*R/r*	*Marginals*
30	11	2.7	36
36	14	2.6	38
45	19	2.4	36

Distribution: It is known only from a very small area just north of the Little Bahama Bank, with a bathymetric range of 824–897 m.

Remarks: The only previous record of *Dipsacaster* in the Atlantic Ocean is that of *D. sladeni* (Table 1). However, this can not be considered a true Atlantic species. It ranges from the Andaman Sea to the Cape of Good Hope, the latter being only a western extension of its Indian Ocean range. Thus, *Dipsacaster antillensis* represents the first species of the genus known from the Atlantic Ocean proper.

Dipsacaster antillensis does not appear to be closely related to any of the known species of *Dipsacaster*. The extremely broad marginal plates serve to distinguish it from all the others except *D. pretiosus* (Döderlein), *D. grandissimus* Goto, and *D. farquharsoni* Macan. The inferomarginals of the first two are spinose; in the last, the arms are more strongly tapered and the inferomarginal spines are at least four times larger than in *D. antillensis*.

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